L1 ANSWER 1 OF 1 MEDLINE on STN
AN 2003574712 MEDLINE
DN PubMed ID: 14654041
TI Pyrophosphorolysis by Type II DNA polymerases: implications for pyrophosphorolysis-activated polymerization.
AU Liu Qiang; Sommer Steve S
CS Department of Molecular Genetics and Department of Molecular Diagnosis, City of Hope National Medical Center, 1500 East Duarte Road, Duarte, CA 91010-3000, USA.
SO Analytical biochemistry, (2004 Jan 1) Vol. 324, No. 1, pp. 22-8.
Journal code: 0370535. ISSN: 0003-2697. L-ISSN: 0003-2697.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200410
ED Entered STN: 16 Dec 2003
Last Updated on STN: 13 Oct 2004
Entered Medline: 12 Oct 2004
AB We find that Type II DNA polymerases can catalyze pyrophosphorolysis, the reverse reaction of DNA polymerization. This property is applied utilizing pyrophosphorolysis-activated polymerization (PAP), a method of nucleic acid amplification using serial coupling of pyrophosphorolysis and polymerization. PAP can be used for ultrarare allele detection (detection of minimal residual disease and cancer risk assessment through measurement of mutation load) and for microarray-based scanning for unknown mutations. Herein, we show that Type II DNA polymerases efficiently catalyze template-dependent pyrophosphorolysis to activate oligonucleotides blocked at their 3' termini with acyclonucleotides in which a 2-hydroxyethoxymethyl group substitutes for the 2'-deoxyribofuranosyl sugar. Type II archeon DNA polymerases Vent (exo-) and Pfu (exo-) can be utilized for PAP or a bidirectional form of PAP with acyclonucleotide-blocked oligonucleotides, but not with dideoxynucleotide-blocked oligonucleotides. In contrast, a Type I DNA polymerase, TaqFS, can utilize either acyclonucleotide-blocked or dideoxynucleotide-blocked oligonucleotides. These findings expand the potential of nascent PAP technology.